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<110> Magainin Pharmaceuticals, Inc.

<120> Asthma-Associated Factors as Targets for Treating
Atopic Allergies, Including Asthma and Related
Disorders

<130> 36870-5073-WO

<140> PCT/US99/04703

<141> 1999-03-03

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<151> 1996-08-23

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gga cga aaa tac tac aca aat aat ttt atc acc aat cta act ttt cgg	1799
Gly Arg Lys Tyr Tyr Thr Asn Asn Phe Ile Thr Asn Leu Thr Phe Arg	
545 550 555 560	
aca gct agt ctt tgg att cca gga aca gct aag cct ggg cac tgg act	1847
Thr Ala Ser Leu Trp Ile Pro Gly Thr Ala Lys Pro Gly His Trp Thr	
565 570 575	
tac acc ctg aac aat acc cat cat tct ctg caa gcc ctg aaa gtg aca	1895
Tyr Thr Leu Asn Asn Thr His His Ser Leu Gln Ala Leu Lys Val Thr	
580 585 590	
gtg acc tct cgt gcc tcc aac tca gct gtg ccc cca gcc act gtg gaa	1943
Val Thr Ser Arg Ala Ser Asn Ser Ala Val Pro Pro Ala Thr Val Glu	
595 600 605	
gcc ttt gtg gaa aga gac agc ctc cat ttt cct cat cct gtg atg att	1991
Ala Phe Val Glu Arg Asp Ser Leu His Phe Pro His Pro Val Met Ile	
610 615 620	
tat gcc aat gtg aaa cag gga ttt tat ccc att ctt aat gcc act gtc	2039
Tyr Ala Asn Val Lys Gln Gly Phe Tyr Pro Ile Leu Asn Ala Thr Val	
625 630 635 640	
act gcc aca gtt gag cca gag act gga gat cct gtt acg ctg aga ctc	2087
Thr Ala Thr Val Glu Pro Glu Thr Gly Asp Pro Val Thr Leu Arg Leu	
645 650 655	
ctt gat gat gga gca ggt gct gat gtt ata aaa aat gat gga att tac	2135
Leu Asp Asp Gly Ala Gly Ala Asp Val Ile Lys Asn Asp Gly Ile Tyr	
660 665 670	
tcg agg tat ttt ttc tcc ttt gct gca aat ggt aga tat agc ttg aaa	2183
Ser Arg Tyr Phe Phe Ser Phe Ala Ala Asn Gly Arg Tyr Ser Leu Lys	
675 680 685	
gtg cat gtc aat cac tct ccc agc ata agc acc cca gcc cac tct att	2231
Val His Val Asn His Ser Pro Ser Ile Ser Thr Pro Ala His Ser Ile	
690 695 700	
cca ggg agt cat gct atg tat gta cca ggt tac aca gca aac ggt aat	2279
Pro Gly Ser His Ala Met Tyr Val Pro Gly Tyr Thr Ala Asn Gly Asn	
705 710 715 720	

att cag atg aat gct cca agg aaa tca gta ggc aga aat gag gag gag	2327
Ile Gln Met Asn Ala Pro Arg Lys Ser Val Gly Arg Asn Glu Glu Glu	
725 730 735	
cga aag tgg ggc ttt agc cga gtc agc tca gga ggc tcc ttt tca gtg	2375
Arg Lys Trp Gly Phe Ser Arg Val Ser Ser Gly Gly Ser Phe Ser Val	
740 745 750	
ctg gga gtt cca gct ggc ccc cac cct gat gtg ttt cca cca tgc aaa	2423
Leu Gly Val Pro Ala Gly Pro His Pro Asp Val Phe Pro Pro Cys Lys	
755 760 765	
att att gac ctg gaa gct gta aaa gta gaa gag gaa ttg acc cta tct	2471
Ile Ile Asp Leu Glu Ala Val Lys Val Glu Glu Glu Leu Thr Leu Ser	
770 775 780	
tgg aca gca cct gga gaa gac ttt gat cag ggc cag gct aca agc tat	2519
Trp Thr Ala Pro Gly Glu Asp Phe Asp Gln Gly Gln Ala Thr Ser Tyr	
785 790 795 800	
gaa ata aga atg agt aaa agt cta cag aat atc caa gat gac ttt aac	2567
Glu Ile Arg Met Ser Lys Ser Leu Gln Asn Ile Gln Asp Asp Phe Asn	
805 810 815	
aat gct att tta gta aat aca tca aag cga aat cct cag caa gct ggc	2615
Asn Ala Ile Leu Val Asn Thr Ser Lys Arg Asn Pro Gln Gln Ala Gly	
820 825 830	
atc agg gag ata ttt acg ttc tca ccc cag att tcc acg aat gga cct	2663
Ile Arg Glu Ile Phe Thr Phe Ser Pro Gln Ile Ser Thr Asn Gly Pro	
835 840 845	
gaa cat cag cca aat gga gaa aca cat gaa agc cac aga att tat gtt	2711
Glu His Gln Pro Asn Gly Glu Thr His Glu Ser His Arg Ile Tyr Val	
850 855 860	
gca ata cga gca atg gat agg aac tcc tta cag tct gct gta tct aac	2759
Ala Ile Arg Ala Met Asp Arg Asn Ser Leu Gln Ser Ala Val Ser Asn	
865 870 875 880	
att gcc cag gcg cct ctg ttt att ccc ccc aat tct gat cct gta cct	2807
Ile Ala Gln Ala Pro Leu Phe Ile Pro Pro Asn Ser Asp Pro Val Pro	
885 890 895	
gcc aga gat tat ctt ata ttg aaa gga gtt tta aca gca atg ggt ttg	2855
Ala Arg Asp Tyr Leu Ile Leu Lys Gly Val Leu Thr Ala Met Gly Leu	
900 905 910	

ata gga atc att tgc ctt att ata gtt gtg aca cat cat act tta agc 2903
 Ile Gly Ile Ile Cys Leu Ile Ile Val Val Thr His His Thr Leu Ser
 915 920 925

agg aaa aag aga gca gac aag aaa gag aat gga aca aaa tta tta 2948
 Arg Lys Lys Arg Ala Asp Lys Lys Glu Asn Gly Thr Lys Leu Leu
 930 935 940

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aaacatacta acaaagtcaa attaacatca aaactgtatt aaaatgcatt gagttttgta 3068

caatacagat aagattttta catggtagat caacaaattc tttttggggg tagattagaa 3128

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Val Gln Leu Gln Asp Asn Gly Tyr Asn Gly Leu Leu Ile Ala Ile Asn
 35 40 45

Pro Gln Val Pro Glu Asn Gln Asn Leu Ile Ser Asn Ile Lys Glu Met
 50 55 60

Ile Thr Glu Ala Ser Phe Tyr Leu Phe Asn Ala Thr Lys Arg Arg Val
 65 70 75 80

Phe Phe Arg Asn Ile Lys Ile Leu Ile Pro Ala Thr Trp Lys Ala Asn
 85 90 95

Asn Asn Ser Lys Ile Lys Gln Glu Ser Tyr Glu Lys Ala Asn Val Ile
 100 105 110

Val Thr Asp Trp Tyr Arg Ala His Gly Asp Asp Pro Tyr Thr Leu Gln

115		120		125
Tyr Arg Gly Cys Gly Lys Glu Gly Lys Tyr Ile His Phe Thr Pro Asn	130	135	140	
Phe Leu Leu Asn Asp Asn Leu Thr Ala Gly Tyr Gly Ser Arg Gly Arg	145	150	155	160
Val Phe Val His Glu Trp Ala His Leu Arg Trp Gly Val Phe Asp Glu	165	170		175
Tyr Asn Asn Asp Lys Pro Phe Tyr Ile Asn Gly Gln Asn Gln Ile Lys	180	185		190
Val Thr Arg Cys Ser Ser Asp Ile Thr Gly Ile Phe Val Cys Glu Lys	195	200		205
Gly Pro Cys Pro Gln Glu Asn Cys Ile Ile Ser Lys Leu Phe Lys Glu	210	215		220
Gly Cys Thr Phe Ile Tyr Asn Ser Thr Gln Ser Ala Thr Ala Ser Ile	225	230	235	240
Met Phe Met Arg Ser Leu Ser Ser Val Val Glu Phe Cys Asn Ala Ser	245		250	255
Thr His Asn Gln Glu Ala Pro Asn Leu Gln Asn Gln Met Cys Ser Leu	260		265	270
Arg Ser Ala Trp Asp Val Ile Thr Asp Ser Ala Asp Phe His His Ser	275	280		285
Phe Pro Met Asn Gly Thr Glu Leu Pro Pro Pro Pro Thr Phe Ser Leu	290	295		300
Val Glu Ala Gly Asp Lys Val Val Cys Leu Val Leu Asp Ala Ser Ser	305	310	315	320
Lys Met Ala Glu Ala Asp Arg Leu Leu Gln Leu Gln Gln Ala Ala Glu	325		330	335
Phe Tyr Leu Met Gln Ile Val Glu Ile His Thr Phe Val Gly Ile Ala	340		345	350
Ser Phe Asp Ser Lys Gly Glu Ile Arg Ala Gln Leu His Gln Ile Asn	355	360		365
Ser Asn Asp Asp Arg Lys Leu Leu Val Ser Tyr Leu Pro Thr Thr Val				

370		375		380
Ser Ala Lys Thr Asp Ile Ser Ile Cys Ser Gly Leu Lys Lys Gly Phe				
385		390		400
Glu Val Val Glu Lys Leu Asn Gly Lys Ala Tyr Gly Ser Val Met Ile				
	405		410	415
Leu Val Thr Ser Gly Asp Asp Lys Leu Leu Gly Asn Cys Leu Pro Thr				
	420		425	430
Val Leu Ser Ser Gly Ser Thr Ile His Ser Ile Ala Leu Gly Ser Ser				
	435		440	445
Ala Ala Pro Asn Leu Glu Glu Leu Ser Arg Leu Thr Gly Gly Leu Lys				
	450		455	460
Phe Phe Val Pro Asp Ile Ser Asn Ser Asn Ser Met Ile Asp Ala Phe				
465		470		480
Ser Arg Ile Ser Ser Gly Thr Gly Asp Ile Phe Gln Gln His Ile Gln				
	485		490	495
Leu Glu Ser Thr Gly Glu Asn Val Lys Pro His His Gln Leu Lys Asn				
	500		505	510
Thr Val Thr Val Asp Asn Thr Val Gly Asn Asp Thr Met Phe Leu Val				
	515		520	525
Thr Trp Gln Ala Ser Gly Pro Pro Glu Ile Ile Leu Phe Asp Pro Asp				
	530		535	540
Gly Arg Lys Tyr Tyr Thr Asn Asn Phe Ile Thr Asn Leu Thr Phe Arg				
545		550		560
Thr Ala Ser Leu Trp Ile Pro Gly Thr Ala Lys Pro Gly His Trp Thr				
	565		570	575
Tyr Thr Leu Asn Asn Thr His His Ser Leu Gln Ala Leu Lys Val Thr				
	580		585	590
Val Thr Ser Arg Ala Ser Asn Ser Ala Val Pro Pro Ala Thr Val Glu				
	595		600	605
Ala Phe Val Glu Arg Asp Ser Leu His Phe Pro His Pro Val Met Ile				
	610		615	620
Tyr Ala Asn Val Lys Gln Gly Phe Tyr Pro Ile Leu Asn Ala Thr Val				

625		630		635		640									
Thr	Ala	Thr	Val	Glu	Pro	Glu	Thr	Gly	Asp	Pro	Val	Thr	Leu	Arg	Leu
				645					650					655	
Leu	Asp	Asp	Gly	Ala	Gly	Ala	Asp	Val	Ile	Lys	Asn	Asp	Gly	Ile	Tyr
			660					665					670		
Ser	Arg	Tyr	Phe	Phe	Ser	Phe	Ala	Ala	Asn	Gly	Arg	Tyr	Ser	Leu	Lys
		675					680					685			
Val	His	Val	Asn	His	Ser	Pro	Ser	Ile	Ser	Thr	Pro	Ala	His	Ser	Ile
		690				695					700				
Pro	Gly	Ser	His	Ala	Met	Tyr	Val	Pro	Gly	Tyr	Thr	Ala	Asn	Gly	Asn
705					710					715					720
Ile	Gln	Met	Asn	Ala	Pro	Arg	Lys	Ser	Val	Gly	Arg	Asn	Glu	Glu	Glu
				725					730					735	
Arg	Lys	Trp	Gly	Phe	Ser	Arg	Val	Ser	Ser	Gly	Gly	Ser	Phe	Ser	Val
			740					745					750		
Leu	Gly	Val	Pro	Ala	Gly	Pro	His	Pro	Asp	Val	Phe	Pro	Pro	Cys	Lys
		755					760				765				
Ile	Ile	Asp	Leu	Glu	Ala	Val	Lys	Val	Glu	Glu	Glu	Leu	Thr	Leu	Ser
		770					775				780				
Trp	Thr	Ala	Pro	Gly	Glu	Asp	Phe	Asp	Gln	Gly	Gln	Ala	Thr	Ser	Tyr
785					790					795					800
Glu	Ile	Arg	Met	Ser	Lys	Ser	Leu	Gln	Asn	Ile	Gln	Asp	Asp	Phe	Asn
				805					810					815	
Asn	Ala	Ile	Leu	Val	Asn	Thr	Ser	Lys	Arg	Asn	Pro	Gln	Gln	Ala	Gly
			820					825					830		
Ile	Arg	Glu	Ile	Phe	Thr	Phe	Ser	Pro	Gln	Ile	Ser	Thr	Asn	Gly	Pro
		835					840					845			
Glu	His	Gln	Pro	Asn	Gly	Glu	Thr	His	Glu	Ser	His	Arg	Ile	Tyr	Val
		850				855					860				
Ala	Ile	Arg	Ala	Met	Asp	Arg	Asn	Ser	Leu	Gln	Ser	Ala	Val	Ser	Asn
865					870				875						880
Ile	Ala	Gln	Ala	Pro	Leu	Phe	Ile	Pro	Pro	Asn	Ser	Asp	Pro	Val	Pro

	885		890		895
Ala Arg Asp Tyr Leu Ile Leu Lys Gly Val Leu Thr Ala Met Gly Leu					
	900		905		910
Ile Gly Ile Ile Cys Leu Ile Ile Val Val Thr His His Thr Leu Ser					
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Arg Lys Lys Arg Ala Asp Lys Lys Glu Asn Gly Thr Lys Leu Leu					
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gaa ggg gcc ctg agt aat tca ctc att cag ctg aac aac aat ggc tat	96
Glu Gly Ala Leu Ser Asn Ser Leu Ile Gln Leu Asn Asn Asn Gly Tyr	
20 25 30	
gaa ggc att gtc gtt gca atc gac ccc aat gtg cca gaa gat gaa aca	144
Glu Gly Ile Val Val Ala Ile Asp Pro Asn Val Pro Glu Asp Glu Thr	
35 40 45	
ctc att caa caa ata aag gac atg gtg acc cag gca tct ctg tat ctg	192
Leu Ile Gln Gln Ile Lys Asp Met Val Thr Gln Ala Ser Leu Tyr Leu	
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ttt gaa gct aca gga aag cga ttt tat ttc aaa aat gtt gcc att ttg	240
Phe Glu Ala Thr Gly Lys Arg Phe Tyr Phe Lys Asn Val Ala Ile Leu	
65 70 75 80	
att cct gaa aca tgg aag aca aag gct gac tat gtg aga cca aaa ctt	288
Ile Pro Glu Thr Trp Lys Thr Lys Ala Asp Tyr Val Arg Pro Lys Leu	
85 90 95	
gag acc tac aaa aat gct gat gtt ctg gtt gct gag tct act cct cca	336
Glu Thr Tyr Lys Asn Ala Asp Val Leu Val Ala Glu Ser Thr Pro Pro	

100	105	110	
ggt aat gat gaa ccc tac act gag cag atg ggc aac tgt gga gag aag Gly Asn Asp Glu Pro Tyr Thr Glu Gln Met Gly Asn Cys Gly Glu Lys 115 120 125			384
ggt gaa agg atc cac ctc act cct gat ttc att gca gga aaa aag tta Gly Glu Arg Ile His Leu Thr Pro Asp Phe Ile Ala Gly Lys Lys Leu 130 135 140			432
gct gaa tat gga cca caa ggt agg gca ttt gtc cat gag tgg gct cat Ala Glu Tyr Gly Pro Gln Gly Arg Ala Phe Val His Glu Trp Ala His 145 150 155 160			480
cta cga tgg gga gta ttt gac gag tac aat aat gat gag aaa ttc tac Leu Arg Trp Gly Val Phe Asp Glu Tyr Asn Asn Asp Glu Lys Phe Tyr 165 170 175			528
tta tcc aat gga aga ata caa gca gta aga tgt tca gca ggt att act Leu Ser Asn Gly Arg Ile Gln Ala Val Arg Cys Ser Ala Gly Ile Thr 180 185 190			576
ggt aca aat gta gta aag aag tgt cag gga ggc agc tgt tac acc aaa Gly Thr Asn Val Val Lys Lys Cys Gln Gly Gly Ser Cys Tyr Thr Lys 195 200 205			624
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ttt gtt ctc caa tcc cgc cag acg gag aag gct tct ata atg ttt gca Phe Val Leu Gln Ser Arg Gln Thr Glu Lys Ala Ser Ile Met Phe Ala 225 230 235 240			720
caa cat gtt gat tct ata gtt gaa ttc tgt aca gaa caa aac cac aac Gln His Val Asp Ser Ile Val Glu Phe Cys Thr Glu Gln Asn His Asn 245 250 255			768
aaa gaa gct cca aac aag caa aat caa aaa tgc aat ctc cga agc aca Lys Glu Ala Pro Asn Lys Gln Asn Gln Lys Cys Asn Leu Arg Ser Thr 260 265 270			816
tgg gaa gtg atc cgt gat tct gag gac ttt aag aaa acc act cct atg Trp Glu Val Ile Arg Asp Ser Glu Asp Phe Lys Lys Thr Thr Pro Met 275 280 285			864
aca aca cag cca cca aat ccc acc ttc tca ttg ctg cag att gga caa Thr Thr Gln Pro Pro Asn Pro Thr Phe Ser Leu Leu Gln Ile Gly Gln			912

290	295	300	
aga att gtg tgt tta gtc ctt gac aaa tct gga agc atg gcg act ggt			960
Arg Ile Val Cys Leu Val Leu Asp Lys Ser Gly Ser Met Ala Thr Gly			
305	310	315	320
aac cgc ctc aat cga ctg aat caa gca ggc cag ctt ttc ctg ctg cag			1008
Asn Arg Leu Asn Arg Leu Asn Gln Ala Gly Gln Leu Phe Leu Leu Gln			
	325	330	335
aca gtt gag ctg ggg tcc tgg gtt ggg atg gtg aca ttt gac agt gct			1056
Thr Val Glu Leu Gly Ser Trp Val Gly Met Val Thr Phe Asp Ser Ala			
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gcc cat gta caa agt gaa ctc ata cag ata aac agt ggc agt gac agg			1104
Ala His Val Gln Ser Glu Leu Ile Gln Ile Asn Ser Gly Ser Asp Arg			
	355	360	365
gac aca ctc gcc aaa aga tta cct gca gca gct tca gga ggg acg tcc			1152
Asp Thr Leu Ala Lys Arg Leu Pro Ala Ala Ala Ser Gly Gly Thr Ser			
	370	375	380
atc tgc agc ggg ctt cga tcg gca ttt act gtg att agg aag aaa tat			1200
Ile Cys Ser Gly Leu Arg Ser Ala Phe Thr Val Ile Arg Lys Lys Tyr			
385	390	395	400
cca act gat gga tct gaa att gtg ctg ctg acg gat ggg gaa gac aac			1248
Pro Thr Asp Gly Ser Glu Ile Val Leu Leu Thr Asp Gly Glu Asp Asn			
	405	410	415
act ata agt ggg tgc ttt aac gag gtc aaa caa agt ggt gcc atc atc			1296
Thr Ile Ser Gly Cys Phe Asn Glu Val Lys Gln Ser Gly Ala Ile Ile			
	420	425	430
cac aca gtc gct ttg ggg ccc tct gca gct caa gaa cta gag gag ctg			1344
His Thr Val Ala Leu Gly Pro Ser Ala Ala Gln Glu Leu Glu Glu Leu			
	435	440	445
tcc aaa atg aca gga ggt tta cag aca tat gct tca gat caa gtt cag			1392
Ser Lys Met Thr Gly Gly Leu Gln Thr Tyr Ala Ser Asp Gln Val Gln			
	450	455	460
aac aat ggc ctc att gat gct ttt ggg gcc ctt tca tca gga aat gga			1440
Asn Asn Gly Leu Ile Asp Ala Phe Gly Ala Leu Ser Ser Gly Asn Gly			
465	470	475	480
gct gtc tct cag cgc tcc atc cag ctt gag agt aag gga tta acc ctc			1488
Ala Val Ser Gln Arg Ser Ile Gln Leu Glu Ser Lys Gly Leu Thr Leu			

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gac aaa aac acc aaa atg gcc tac ctc caa atc cca ggc att gct aag Asp Lys Asn Thr Lys Met Ala Tyr Leu Gln Ile Pro Gly Ile Ala Lys 545 550 555 560			1680
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ctg act gtc acg tcc cgt gcg tcc aat gct acc ctg cct cca att aca Leu Thr Val Thr Ser Arg Ala Ser Asn Ala Thr Leu Pro Pro Ile Thr 580 585 590			1776
gtg act tcc aaa acg aac aag gac acc agc aaa ttc ccc agc cct ctg Val Thr Ser Lys Thr Asn Lys Asp Thr Ser Ser Lys Phe Pro Ser Pro Leu 595 600 605			1824
gta gtt tat gca aat att cgc caa gga gcc tcc cca att ctc agg gcc Val Val Tyr Ala Asn Ile Arg Gln Gly Ala Ser Pro Ile Leu Arg Ala 610 615 620			1872
agt gtc aca gcc ctg att gaa tca gtg aat gga aaa aca gtt acc ttg Ser Val Thr Ala Leu Ile Glu Ser Val Asn Gly Lys Thr Val Thr Leu 625 630 635 640			1920
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gtc tac tca agg tat ttc aca act tat gac acg aat ggt aga tac agt Val Tyr Ser Arg Tyr Phe Thr Thr Tyr Asp Thr Asn Gly Arg Tyr Ser 660 665 670			2016
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690	695 700		
gat gaa atc caa tgg aat cca cca aga cct	gaa att aat aag gat gat	2160	
Asp Glu Ile Gln Trp Asn Pro Pro Arg Pro	Glu Ile Asn Lys Asp Asp		
705	710 715 720		
gtt caa cac aag caa gtg tgt ttc agc aga	aca tcc tcg gga ggc tca	2208	
Val Gln His Lys Gln Val Cys Phe Ser Arg	Thr Ser Ser Gly Gly Ser		
725	730 735		
ttt gtg gct tct gat gtc cca aat gct ccc	ata cct gat ctc ttc cca	2256	
Phe Val Ala Ser Asp Val Pro Asn Ala Pro	Ile Pro Asp Leu Phe Pro		
740	745 750		
cct ggc caa atc acc gac ctg aag gcg gaa	att cac ggg ggc agt ctc	2304	
Pro Gly Gln Ile Thr Asp Leu Lys Ala Glu	Ile His Gly Gly Ser Leu		
755	760 765		
att aat ctg act tgg aca gct cct ggg gat	gat tat gac cat gga aca	2352	
Ile Asn Leu Thr Trp Thr Ala Pro Gly Asp	Asp Tyr Asp His Gly Thr		
770	775 780		
gct cac aag tat atc att cga ata agt aca	agt att ctt gat ctc aga	2400	
Ala His Lys Tyr Ile Ile Arg Ile Ser Thr	Ser Ile Leu Asp Leu Arg		
785	790 795 800		
gac aag ttc aat gaa tct ctt caa gtg aat	act act gct ctc atc cca	2448	
Asp Lys Phe Asn Glu Ser Leu Gln Val Asn	Thr Thr Ala Leu Ile Pro		
805	810 815		
aag gaa gcc aac tct gag gaa gtc ttt ttg	ttt aaa cca gaa aac att	2496	
Lys Glu Ala Asn Ser Glu Glu Val Phe Leu	Phe Lys Pro Glu Asn Ile		
820	825 830		
act ttt gaa aat ggc aca gat ctt ttc att	gct att cag gct gtt gat	2544	
Thr Phe Glu Asn Gly Thr Asp Leu Phe Ile	Ala Ile Gln Ala Val Asp		
835	840 845		
aag gtc gat ctg aaa tca gaa ata tcc aac	att gca cga gta tct ttg	2592	
Lys Val Asp Leu Lys Ser Glu Ile Ser Asn	Ile Ala Arg Val Ser Leu		
850	855 860		
ttt att cct cca cag act ccg cca gag aca	cct agt cct gat gaa acg	2640	
Phe Ile Pro Pro Gln Thr Pro Pro Glu Thr	Pro Ser Pro Asp Glu Thr		

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Ser Ala Pro Cys Pro Asn Ile His Ile Asn Ser Thr Ile Pro Gly Ile				
885		890	895	

cac att tta aaa att atg tgg aag tgg ata gga gaa ctg cag ctg tca	2736
His Ile Leu Lys Ile Met Trp Lys Trp Ile Gly Glu Leu Gln Leu Ser	
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	910

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Ile Ala	

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Glu Gly Ile Val Val Ala Ile Asp Pro Asn Val Pro Glu Asp Glu Thr	
35	45

Leu Ile Gln Gln Ile Lys Asp Met Val Thr Gln Ala Ser Leu Tyr Leu	
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Phe Glu Ala Thr Gly Lys Arg Phe Tyr Phe Lys Asn Val Ala Ile Leu	
65	80

Ile Pro Glu Thr Trp Lys Thr Lys Ala Asp Tyr Val Arg Pro Lys Leu	
85	95

Glu Thr Tyr Lys Asn Ala Asp Val Leu Val Ala Glu Ser Thr Pro Pro	
100	110

Gly Asn Asp Glu Pro Tyr Thr Glu Gln Met Gly Asn Cys Gly Glu Lys	
115	125

Gly Glu Arg Ile His Leu Thr Pro Asp Phe Ile Ala Gly Lys Lys Leu	
130	140

Ala Glu Tyr Gly Pro Gln Gly Arg Ala Phe Val His Glu Trp Ala His	
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145		150		155		160
Leu Arg Trp Gly Val Phe Asp Glu Tyr Asn Asn Asp Glu Lys Phe Tyr						
	165			170		175
Leu Ser Asn Gly Arg Ile Gln Ala Val Arg Cys Ser Ala Gly Ile Thr						
	180			185		190
Gly Thr Asn Val Val Lys Lys Cys Gln Gly Gly Ser Cys Tyr Thr Lys						
	195			200		205
Arg Cys Thr Phe Asn Lys Xaa Thr Gly Leu Tyr Glu Lys Gly Cys Glu						
	210			215		220
Phe Val Leu Gln Ser Arg Gln Thr Glu Lys Ala Ser Ile Met Phe Ala						
	225			230		235
						240
Gln His Val Asp Ser Ile Val Glu Phe Cys Thr Glu Gln Asn His Asn						
	245			250		255
Lys Glu Ala Pro Asn Lys Gln Asn Gln Lys Cys Asn Leu Arg Ser Thr						
	260			265		270
Trp Glu Val Ile Arg Asp Ser Glu Asp Phe Lys Lys Thr Thr Pro Met						
	275			280		285
Thr Thr Gln Pro Pro Asn Pro Thr Phe Ser Leu Leu Gln Ile Gly Gln						
	290			295		300
Arg Ile Val Cys Leu Val Leu Asp Lys Ser Gly Ser Met Ala Thr Gly						
	305			310		315
						320
Asn Arg Leu Asn Arg Leu Asn Gln Ala Gly Gln Leu Phe Leu Leu Gln						
	325			330		335
Thr Val Glu Leu Gly Ser Trp Val Gly Met Val Thr Phe Asp Ser Ala						
	340			345		350
Ala His Val Gln Ser Glu Leu Ile Gln Ile Asn Ser Gly Ser Asp Arg						
	355			360		365
Asp Thr Leu Ala Lys Arg Leu Pro Ala Ala Ala Ser Gly Gly Thr Ser						
	370			375		380
Ile Cys Ser Gly Leu Arg Ser Ala Phe Thr Val Ile Arg Lys Lys Tyr						
	385			390		395
						400
Pro Thr Asp Gly Ser Glu Ile Val Leu Leu Thr Asp Gly Glu Asp Asn						

	405		410		415
Thr Ile Ser Gly Cys Phe Asn Glu Val Lys Gln Ser Gly Ala Ile Ile	420		425		430
His Thr Val Ala Leu Gly Pro Ser Ala Ala Gln Glu Leu Glu Glu Leu	435		440		445
Ser Lys Met Thr Gly Gly Leu Gln Thr Tyr Ala Ser Asp Gln Val Gln	450		455		460
Asn Asn Gly Leu Ile Asp Ala Phe Gly Ala Leu Ser Ser Gly Asn Gly	465		470		475
					480
Ala Val Ser Gln Arg Ser Ile Gln Leu Glu Ser Lys Gly Leu Thr Leu		485		490	495
Gln Asn Ser Gln Trp Met Asn Gly Thr Val Ile Val Asp Ser Thr Val		500		505	510
Gly Lys Asp Thr Leu Phe Leu Ile Thr Trp Thr Thr Gln Pro Pro Gln		515		520	525
Ile Leu Leu Trp Asp Pro Ser Gly Gln Lys Gln Gly Gly Phe Val Val		530		535	540
Asp Lys Asn Thr Lys Met Ala Tyr Leu Gln Ile Pro Gly Ile Ala Lys		545		550	555
					560
Val Gly Thr Trp Lys Tyr Ser Leu Gln Ala Ser Ser Gln Thr Leu Thr		565		570	575
Leu Thr Val Thr Ser Arg Ala Ser Asn Ala Thr Leu Pro Pro Ile Thr		580		585	590
Val Thr Ser Lys Thr Asn Lys Asp Thr Ser Lys Phe Pro Ser Pro Leu		595		600	605
Val Val Tyr Ala Asn Ile Arg Gln Gly Ala Ser Pro Ile Leu Arg Ala		610		615	620
Ser Val Thr Ala Leu Ile Glu Ser Val Asn Gly Lys Thr Val Thr Leu		625		630	635
					640
Glu Leu Leu Asp Asn Gly Ala Gly Ala Asp Ala Thr Lys Asp Asp Gly		645		650	655
Val Tyr Ser Arg Tyr Phe Thr Thr Tyr Asp Thr Asn Gly Arg Tyr Ser					

660	665	670
Val Lys Val Arg Ala Leu Gly Gly Val Asn Ala Ala Arg Arg Arg Val		
675	680	685
Ile Pro Gln Gln Ser Gly Ala Leu Tyr Ile Pro Gly Trp Ile Glu Asn		
690	695	700
Asp Glu Ile Gln Trp Asn Pro Pro Arg Pro Glu Ile Asn Lys Asp Asp		
705	710	715 720
Val Gln His Lys Gln Val Cys Phe Ser Arg Thr Ser Ser Gly Gly Ser		
725	730	735
Phe Val Ala Ser Asp Val Pro Asn Ala Pro Ile Pro Asp Leu Phe Pro		
740	745	750
Pro Gly Gln Ile Thr Asp Leu Lys Ala Glu Ile His Gly Gly Ser Leu		
755	760	765
Ile Asn Leu Thr Trp Thr Ala Pro Gly Asp Asp Tyr Asp His Gly Thr		
770	775	780
Ala His Lys Tyr Ile Ile Arg Ile Ser Thr Ser Ile Leu Asp Leu Arg		
785	790	795 800
Asp Lys Phe Asn Glu Ser Leu Gln Val Asn Thr Thr Ala Leu Ile Pro		
805	810	815
Lys Glu Ala Asn Ser Glu Glu Val Phe Leu Phe Lys Pro Glu Asn Ile		
820	825	830
Thr Phe Glu Asn Gly Thr Asp Leu Phe Ile Ala Ile Gln Ala Val Asp		
835	840	845
Lys Val Asp Leu Lys Ser Glu Ile Ser Asn Ile Ala Arg Val Ser Leu		
850	855	860
Phe Ile Pro Pro Gln Thr Pro Pro Glu Thr Pro Ser Pro Asp Glu Thr		
865	870	875 880
Ser Ala Pro Cys Pro Asn Ile His Ile Asn Ser Thr Ile Pro Gly Ile		
885	890	895
His Ile Leu Lys Ile Met Trp Lys Trp Ile Gly Glu Leu Gln Leu Ser		
900	905	910
Ile Ala		

<210> 7
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: sense primer
for mouse ICACC-1 RNA

<400> 7
ccagatccac accaaaacga gaag

24

<210> 8
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: anti-sense
primer for mouse ICACC-1 RNA

<400> 8
cactgtcaaa ggtcaccatc ccga

24

<210> 9
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: sense primer
for human ICACC-1 RNA

<400> 9
gattccagga acagctaagc

20

<210> 10
<211> 22
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: anti-sense
primer for human ICACC-1 RNA

<400> 10

tatttcatag cttgtagcct gg

22

<210> 11

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR 5' primer
for ICACC-1

<400> 11

cccaaaggaa gccaaactctg a

21

<210> 12

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR 3' primer
for ICACC-1

<400> 12

gtgaatgcc a ggaatggtgc t

21

<210> 13

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide for
immunization to mICACC-1

<400> 13

Cys Leu Val Leu Asp Lys Ser Gly Ser Met Leu Asn Asp Asp Arg Leu
1 5 10 15

Asn Arg Met Asn Gln Ala

20

<210> 14
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: peptide for
immunization to mICACC-1

<400> 14
Gln Ser Glu Leu Lys Gln Leu Asn Ser Gly Ala Asp Arg Asp Leu Leu
1 5 10 15

Ile Lys His Cys
20

<210> 15
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: peptide for
immunization to mICACC-1

<400> 15
Lys Lys Lys Tyr Pro Thr Asp Gly Ser Glu Ile Val Leu Leu Thr Asp
1 5 10 15

Gly Glu Asp Asn Thr Ile Ser Ser Cys
20 25

<210> 16
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: peptide for
immunization to mICACC-1

<400> 16
Thr Thr His Pro Pro Thr Ile Phe Ile Trp Asp Pro S r Gly Val Glu
1 5 10 15

Gln Asn Gly Phe Ile Leu Asp Cys
20

<210> 17

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide for
immunization to mICACC-1

<400> 17

Cys Pro Pro Ile Thr Val Thr Pro Val Val Asn Lys Asn Thr Gly Lys
1 5 10 15

Phe Pro Ser Pro Val Thr
20

<210> 18

<211> 903

<212> PRT

<213> Bos taurus

<400> 18

Met Val Pro Arg Leu Thr Val Ile Leu Phe Leu Thr Leu His Leu Leu
1 5 10 15

Pro Gly Met Lys Ser Ser Met Val Asn Leu Ile Asn Asn Gly Tyr Asp
20 25 30

Gly Ile Val Ile Ala Ile Asn Pro Ser Val Pro Glu Asp Glu Lys Leu
35 40 45

Ile Gln Asn Ile Lys Glu Met Val Thr Glu Ala Ser Thr Tyr Leu Phe
50 55 60

His Ala Thr Lys Arg Arg Val Tyr Phe Arg Asn Val Ser Ile Leu Ile
65 70 75 80

Pro Met Thr Trp Lys Ser Lys Ser Glu Tyr Leu Met Pro Lys Gln Glu
85 90 95

Ser Tyr Asp Gln Ala Glu Val Ile Val Ala Asn Pro Tyr Leu Lys His
100 105 110

Gly Asp Asp Pro Tyr Thr Leu Gln Tyr Gly Arg Cys Gly Glu Lys Gly
 115 120 125
 Gln Tyr Ile His Phe Thr Pro Asn Phe Leu Leu Thr Asn Asn Leu Pro
 130 135 140
 Ile Tyr Gly Ser Arg Gly Arg Ala Phe Val His Glu Trp Ala His Leu
 145 150 155 160
 Arg Trp Gly Ile Phe Asp Glu Tyr Asn Gly Asp Gln Pro Phe Tyr Ile
 165 170 175
 Ser Arg Arg Asn Thr Ile Glu Ala Thr Arg Cys Ser Thr His Ile Thr
 180 185 190
 Gly Thr Asn Val Ile Val Lys Cys Gln Gly Gly Ser Cys Ile Thr Arg
 195 200 205
 Pro Cys Arg Arg Asp Ser Gln Thr Gly Leu Tyr Glu Ala Lys Cys Thr
 210 215 220
 Phe Ile Pro Glu Lys Ser Gln Thr Ala Arg Glu Ser Ile Met Phe Met
 225 230 235 240
 Gln Ser Leu His Ser Val Thr Glu Phe Cys Thr Glu Lys Thr His Asn
 245 250 255
 Val Glu Ala Pro Asn Leu Gln Asn Lys Met Cys Asn Gly Lys Ser Thr
 260 265 270
 Trp Asp Val Ile Met Asn Ser Thr Asp Phe Gln Asn Thr Ser Pro Met
 275 280 285
 Thr Glu Met Asn Pro Pro Thr Gln Pro Thr Phe Ser Leu Leu Lys Ser
 290 295 300
 Lys Gln Arg Val Val Cys Leu Val Leu Asp Lys Ser Gly Ser Met Ser
 305 310 315 320
 Ser Glu Asp Arg Leu Phe Arg Met Asn Gln Ala Ala Glu Leu Phe Leu
 325 330 335
 Ile Gln Ile Ile Glu Lys Gly Ser Leu Val Gly Met Val Thr Phe Asp
 340 345 350
 Ser Val Ala Glu Ile Arg Asn Asn Leu Thr Lys Ile Thr Asp Asp Asn
 355 360 365

Val Tyr Glu Asn Ile Thr Ala Asn Leu Pro Gln Glu Ala Asn Gly Gly
 370 375 380
 Thr Ser Ile Cys Arg Gly Leu Lys Ala Gly Phe Gln Ala Ile Ile Gln
 385 390 395 400
 Ser Gln Gln Ser Thr Ser Gly Ser Glu Ile Ile Leu Leu Thr Asp Gly
 405 410 415
 Glu Asp Asn Glu Ile His Ser Cys Ile Glu Glu Val Lys Gln Ser Gly
 420 425 430
 Val Ile Ile His Thr Ile Ala Leu Gly Pro Ser Ala Ala Lys Glu Leu
 435 440 445
 Glu Thr Leu Ser Asp Met Thr Gly Gly His Arg Phe Tyr Ala Asn Lys
 450 455 460
 Asp Ile Asn Gly Leu Thr Asn Ala Phe Ser Arg Ile Ser Ser Arg Ser
 465 470 475 480
 Gly Ser Ile Thr Gln Gln Thr Ile Gln Leu Glu Ser Lys Ala Leu Ala
 485 490 495
 Ile Thr Glu Lys Lys Trp Val Asn Gly Thr Val Pro Val Asp Ser Thr
 500 505 510
 Ile Gly Asn Asp Thr Phe Phe Val Val Thr Trp Thr Ile Lys Lys Pro
 515 520 525
 Glu Ile Leu Leu Gln Asp Pro Lys Gly Lys Lys Tyr Lys Thr Ser Asp
 530 535 540
 Phe Lys Glu Asp Lys Leu Asn Ile His Ser Ala Arg Leu Arg Ile Pro
 545 550 555 560
 Gly Ile Ala Glu Thr Gly Thr Trp Thr Tyr Ser Leu Leu Asn Asn His
 565 570 575
 Ala Ser Pro Gln Ile Leu Thr Val Thr Val Thr Thr Arg Ala Arg Ser
 580 585 590
 Pro Thr Thr Pro Pro Val Thr Ala Thr Ala His Met Ser Gln Asn Thr
 595 600 605
 Ala His Tyr Pro Ser Pro Val Ile Val Tyr Ala Gln Val Ser Gln Gly
 610 615 620

Phe Leu Pro Val Leu Gly Ile Asn Val Thr Ala Ile Ile Glu Thr Glu
 625 630 635 640
 Asp Gly His Gln Val Thr Leu Glu Leu Trp Asp Asn Gly Ala Gly Ala
 645 650 655
 Asp Thr Val Lys Asn Asp Gly Ile Tyr Ser Arg Tyr Phe Thr Asp Tyr
 660 665 670
 Arg Gly Asn Gly Arg Tyr Ser Leu Lys Val His Ala Glu Ala Arg Asn
 675 680 685
 Asn Thr Ala Arg Leu Ser Leu Arg Gln Pro Gln Asn Lys Ala Leu Tyr
 690 695 700
 Ile Pro Gly Tyr Ile Glu Asn Gly Lys Ile Ile Leu Asn Pro Pro Arg
 705 710 715 720
 Pro Glu Val Lys Asp Asp Leu Ala Lys Ala Glu Ile Glu Asp Phe Ser
 725 730 735
 Arg Leu Thr Ser Gly Gly Ser Phe Thr Val Ser Gly Ala Pro Pro Gly
 740 745 750
 Asn His Pro Ser Val Leu Pro Pro Asn Lys Ile Ile Asp Leu Glu Ala
 755 760 765
 Lys Phe Lys Glu Asp His Ile Gln Leu Ser Trp Thr Ala Pro Ala Asn
 770 775 780
 Val Leu Asp Lys Gly Lys Ala Asn Ser Tyr Ile Ile Arg Ile Ser Lys
 785 790 795 800
 Ser Phe Leu Asp Leu Gln Lys Asp Phe Asp Asn Ala Thr Leu Val Asn
 805 810 815
 Thr Ser Ser Leu Lys Pro Lys Glu Ala Gly Ser Asp Glu Asn Phe Glu
 820 825 830
 Phe Lys Pro Glu Pro Phe Arg Ile Glu Asn Gly Thr Asn Phe Tyr Ile
 835 840 845
 Ala Val Gln Ala Ile Asn Glu Ala Asn Leu Thr Ser Glu Val Ser Asn
 850 855 860
 Ile Ala Gln Ala Ile Lys Phe Ile Pro Met Pro Glu Asp Ser Val Pro
 865 870 875 880

Ala Leu Gly Thr Lys Ile Ser Ala Ile Asn Leu Ala Ile Phe Ala Leu
885 890 895

Ala Met Ile Leu Ser Ile Val
900